tioned. The reviewer is convinced that as good an argument might be made from the zoological side as de Vries has made from the botanical. Undoubtedly many, if not most, of the characteristics of the races of domesticated animals and probably of feral species have arisen by mutation. Take, for example, poultry. The qualities that differentiate them are of the order of mutations—feathered feet, rose comb, elongated tail, taillessness, silky feathers, frizzled feathers, cerebral hernia, polydactyl feet, albinism and many others. All the evidence we have goes to show that these have arisen suddenly, and none of them is halved in cross-breeding. Various wild birds show these same qualities and we must conclude that in wild species also these characteristics have arisen suddenly. Thus we have various wild birds with crests like the Polish fowl (*i. e.*, the umbrella bird, *Cephalopterus*); there are 'cross bills,' showing an abnormality not uncommon among poultry; there is a syndactyl species of monkey; and there are hairless species of mammals. The long tailed condition of certain Japanese fowl is exactly duplicated in the widow-bird (*Chera*). There is hardly a sport not actually prejudicial to the well being of animals which is not realized in some species.

On the other hand, it is certainly true for zoology that many species are based chiefly on 'more' or 'less' of a certain character than an allied species. Further, since animals have a more definite form than plants, and one less modified by variations in environment the fact of geographic variation is a striking one. Now in geographic variation the forms of adjacent localities are distinguished by differences of the order of fluctuating variants; the mode being different in each place; yet the differences between remote localities are of the order of mutations. Geographic variation has been repeatedly observed among birds, fishes, insects and mollusca. It is, of course, possible that the absence of discontinuity in the species may be due to hybridization with blending of characteristics, but blending of characteristics is not so common among hybrids as to justify, offhand, such an explanation. That there is evidence of evolution without mutation can not be denied.

The distinction between species and varieties is clearly expressed by de Vries, but it is doubtful if it will be of wide service because of the difficulty of distinguishing between a 'new' character and an 'atavism.' De Vries admits (p. 564) 'It is often difficult to decide whether a given form belongs to one or another of these two groups.' We look with interest to the experimental testing of de Vries's distinction in animals.

As to the literary qualities of the book, one has first to praise the general method of exposition. It is quite a model. Apart from an occasional non-idiomatic phrase or inapt word the diction is good; but much of this success is of course due to Dr. MacDougal's careful editing. It is unfortunate that the proof reading has been rather carelessly done and that commas are so atrociously misplaced as often to obscure the sense. Otherwise the publishers have done their part well. The broad margins leave plenty of room for the reader's remarks and memoranda which so suggestive a book tends to call forth in great number.

De Vries's book is one to read and reread and then to act upon. We would not wish it less clear cut in its presentation, for then it might merely amuse. As it is it gives a stimulus to the experimental testing of his broad generalizations and iconoclastic conclusions.

C. B. Davenport.

Theoretical Chemistry from the Standpoint of Avogadra's Rule and Thermodynamics. By Professor Walter Nernst, Ph.D., of the University of Göttingen. Revised in accordance with the Fourth German edition. Translated into English by Robert A. Lehfeldt. London and New York, Macmillan and Company, Limited. 1904. Pp. 771.

The appearance of the fourth edition of this valuable treatise will be welcomed by all advanced workers in the field of physical chemistry. The general character of this work is too well known to call for special comment. It is distinctively an advanced work, and adapted only to those who have already a good

general knowledge of the elements of physical chemistry.

It is an unfortunate beginner into whose innocent hands such a book is placed, and this leads to a few words in reference to this phase of the subject of teaching science. It is a fair question to ask whether the error is not frequently made by over-zealous teachers, of placing works that are too advanced in the hands of their pupils. The reviewer recalls having heard a teacher of organic chemistry announce rather boastfully that his class of beginners in organic chemistry was given Richter's book, and made to master its entire contents, *i. e.*, master it from the standpoint of examination.

This was only a little more unfortunate than the placing of Ostwald's inorganic chemistry in the possession of those who were just beginning the study of general chemistry. The result in both cases would be the same, of course, inevitable failure.

A similar result would be secured by beginning the study of physical chemistry with the book under review.

A few words must be added in reference to the English translation. The translation of the first edition of this book into English, as is well-known, left much to be desired. It is not too much to say that it was inadequate and unsatisfactory. It was with some feeling of relief that the new translation was greeted. It seemed that this admirable book would now be rendered into satisfactory English. It is deeply to be regretted that the examination of the translation showed that it did not fulfil this expectation. The translator states in his own preface that 'The bulk of the old text, however, remains as it was.' This is most disappointing.

If we examine the translation page by page, we shall find so many glaring violations of good, clear, idiomatic English that we soon become disheartened. These reasons alone lead us to advise those who would work through the book to use the original German; and this raises the further question, whether it is even desirable to translate such an advanced work from the German into English? Any one who can use this book with profit can, or at least should be able to read German with ease. Is it not catering to a wrong principle to make such a work accessible to those who *must master German,* if they would follow scientific thought to any depth, to say nothing of making contributions to scientific knowledge? Every one will answer this question for himself.

In criticizing the translation adversely, it must, however, not be forgotten that to secure even this result involved an enormous amount of drudgery on the part of the translator, which will be appreciated by every one who has translated even a small book.

HARRY C. JONES.

SCIENTIFIC JOURNALS AND ARTICLES.

THE contents of *The American Journal of Anatomy* for September are as follows:

FRANKLIN P. MALL: 'On the Angle of the Elbow.'

E. LINDON MELLUS: 'A Study of the Location and Arrangement of the Giant Cells in the Cortex of the Right Hemisphere of the Bonnet Monkey (*Macacus Sinicus*).'

SUSANNA PHELPS GAGE: 'A Three Weeks' Human Embryo, with Especial Reference to the Brain and the Nephric System.'

WILLIAM SNOW MILLER: 'The Blood and Lymph Vessels of the Lung of *Necturus maculatus*.'

FRANK A. STROMSTEN: 'A Contribution to the Anatomy and Development of the Venous System of *Chelonia*.'

The Journal of Nervous and Mental Diseases for August opens with a study of clinical and post-mortem records bearing on the operability of brain tumors and their symptomatology, by Drs. G. L. Walton and W. E. Paul. Following this, Dr. S. D. Ludlum reports an experimental study on the regeneration of the peripheral nerves; and the presidential address delivered by Dr. Spiller before the American Neurological Association, on the importance in clinical diagnosis of paralysis of associated movements of the eyeballs, especially of upward and downward movements, is concluded in this number. It is extensively illustrated and elucidated by tables. The leading article in the September issue is by